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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,531	07/23/2003	Jacques Colinge	64176.000005	6658

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EXAMINER	
SKIBINSKY, ANNA	
ART UNIT	**PAPER NUMBER**
1631	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/22/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/624,531	COLINGE ET AL.	
	Examiner	Art Unit	
	Anna Skibinsky	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58* is/are pending in the application.

4a) Of the above claim(s) *1-11 and 25-58* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/05/05, 1/24/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Election/Restriction

1. Applicant's election without traverse of Group II, claims 12-24 in the reply filed on November 9, 2006 is acknowledged.

2. Claim1-11 and 25-58 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on November 9, 2006.

Objection to Specification

Sequences Compliance

This application contains sequence disclosures that are encompassed by the definitions for nucleotide and /or amino acid sequences set forth in CFR § 1.821(a)(1) and (a)(2). See, for example paragraph [0049],Table 4, and throughout the specification and there is not CRF or SEQ ID No's associated with them. This application fails to comply with the requirements of CFR § 1.821 through 1.825 because it lacks any submission of a computer readable form sequence listing, a paper copy for the specification, a statement under CFR § 1.821(f) and (g), and SEQ ID numbers cited along with each sequence in the specification or Figures. Applicants are also reminded that SEQ ID numbers are not required in the Figures per se, however, the corresponding SEQ ID numbers then are required in the Brief Description of the Drawings section in the specification. Applicants are also reminded that a CD_ROM sequence listing submission may replace the paper and computer readable form sequence listing copies.

Applicants are given the same response time regarding this failure to comply as that set forth to respond to this office action. Failure to respond to this requirement may result in abandonment of the instant application or a notice of a failure to fully respond to this Office Action.

Disclosure

The disclosure is objected to because of the following informalities: Hyperlinks are present in paragraph [0071], which should be deactivated. Appropriate correction is required.

Claim Rejections - 35 USC § 101

Claims 12-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 12-23 are drawn to a process. A statutory process must include a step of a physical transformation, or produce a useful, concrete, and tangible result (State Street Bank & Trust Co. v. Signature Financial Group Inc. CAFC 47 USPQ2d 1596 (1998), AT&T Corp. v. Excel Communications Inc. (CAFC 50 USPQ2d 1447 (1999)). In the instant claims, there is no step of physical transformation, thus the Examiner must determine if the instant claims include a useful, concrete, and tangible result.

In determining if the claimed subject matter produces a useful, concrete, and tangible result, the Examiner must determine each standard individually. For a claim to be "useful," the claim must produce a result that is specific, and substantial. For a claim to be "concrete," the process must have a result that is reproducible. For a claim to be "tangible," the process must

produce a real world result . Furthermore, the claim must be limited only to statutory embodiments.

Claims 12-23 do not produce a tangible result. A tangible result requires that the claim must set forth a practical application to produce a real-world result. This rejection could be overcome by amendment of the claims to recite that a result of the method is outputted to a display or other computer on a network, or by including a physical transformation.

Claim Rejections - 35 USC § 112-2nd paragraph

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 12 recites "s is a peptide" in line 13, which is unclear as to whether "a peptide" refers to the candidate peptide recited in claim 12, line 7, or another peptide. For the purpose of examination "a peptide" in line 12 will be interpreted as a candidate peptide.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 12-15 and 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bafna et al. (2001; NPL #28) and further in view of Blumenfeld et al. (P/N 6,432,648).

7. Claim 12 recites providing information associated with an experimental peptide where the information comprises at least mass spectrum information associated with the experimental peptide and at least one fragment of the experimental peptide and providing information associated with a candidate peptide, and furthermore, defining as extended match based on the information associated with the experimental and candidate peptide.

8. Bafna et al. teach software programs for analyzing MS data that take MS/MS spectrum (page S14, col. 2, lines 22-28) generated from an experimental peptide (and is therefore "associated with the experimental peptide and at least one fragment of the experimental peptide", as in claim 12, lines 3-4) and outputs a list of candidate peptide sequences that might have generated the MS/MS spectrum (page S14, col. 2, lines 29-32), which are the information associated with a candidate peptide (as in claim 12, line 5) and the entire list is the extended match (as in claim 12, lines 6-7).

9. Claim 12 further recites generating a stochastic model based on the information associated with the experimental and candidate peptide.

10. Bafna et al. teach that the list of candidate peptides are generated along with a ranking order (page S14, col. 2, lines 33-37) which is a "model" of how well the extended list of candidates match with the experimental peptide.

11. Claim 12 further recites scoring the extended match based on a likelihood ratio (claim 12, line 10), where the ratio is a ration of probabilities bases on D, extra information; s, a peptide sequence; H1, a hypothesis that the peptide sequence s is the correct sequence of the experimental peptide; H0, a null-hypothesis that the peptide sequence s is an erroneous sequence of the experimental peptide, and where in the probabilities are calculated based on the stochastic model.

12. Bafna et al. teach calculating a p-value which is the probability that the score was achieved by random chance. The p-value involves a null-hypothesis (as in claim 12, lines 17-18). Furthermore, the p-value involves a probability that the peptide sequence is the correct sequence (as in claim 12, lines 15-16).

13. Since the scoring is generated from input MS/MS data and matching against a database of sequences as taught by Bafna et al., this reads on D, any extra information associated with the experimental and candidate peptide (claim 12, lines 12-3) and s, a peptide sequence (claim 12, line 14).

14. As in claim 12, lines 19-20, the probabilities given by the p-value taught by Bafna et al. are calculated based on the stochastic model, which is the list of candidate peptides generated by the program, along with a ranking order (page S14, col. 2, lines 33-37).

15. Claim 13 recites that the extended match is a random variable that further comprises one or more random variables which comprises peptide match that characterizes a match between the experimental and candidate peptide (claim 13, lines 4-5), charge z that is used to match the m/z ratio of the experimental peptide with the candidate peptide (claim 13, lines 9-10), and random variables observable or derivable based on the information associated with the experimental and candidate peptide (claim 13, lines 16-17).

16. Bafna et al. teaches the input of MS/MS spectra which comprises m/z data (page S14, col. 2, lines 22-18; and Figure 2) which also contains random variables that may be observable or derivable, and leads to the calculation of the extended match which results in a list of candidate sequences of varying rank of matching with the experimental sequence. The matching taught by Bafna et al. is done after matching of experimental peptide mass against the candidate peptide mass (page S14, col. 2, lines 45-49).

17. Claims 14 and 15 recite determining an empirical probability distribution for the one or more random variables based on matches between the experimental data for known peptides and peptides in a database.

18. Bafna et al. teach calculating the p-value which is a probability for each of the candidate peptides (which is a probability distribution) in a database which are matched with the experimental peptide represented by an input MS/MS spectra.

19. Claim 18 recites comparing the candidate peptide mass with the experimental peptide mass and scoring the extended match based on the likelihood ratio if the difference is in a predetermined range.

20. Bafna et al. teach that only peptides with mass approximately equal to the parent peptide mass of the MS/MS spectrum need be considered for scoring (page S14, col. 2, lines 45-49).

21. Claim 19 recites adjusting the stochastic model and parameters based on learning data set of peptides that have been identified or set of know peptide standards.

22. Bafna et al. teach the generation of a stochastic model from the probability distribution generated from many training samples (page S15, col. 2, lines 28-38).

23. Claim 20 recites an output that comprises a p-value.

24. Bafna et al. teach scoring peptides including p-values (page S15, col. 2, lines 13-15).

25. Claims 21 and 22 recite a theoretical fragmentation spectrum of the candidate peptide that includes masses of corresponding fragment isotopes.

26. Bafna et al. teach a list of candidate peptides that might have generated the MS/MS spectrum (page S14, col. 2, lines 29-32) and the use of tandem mass spectrometry to produce ionized fragments of the peptides that have their mass-charge ratio measured (page S13, col. 2, lines 4-18).

27. Claim 23 recites filtering the candidate peptide based on the molecular weight of the protein that the candidate peptide belongs to, a non-symmetric mass window, and a set of possible masses made of the union of a plurality of mass intervals.

28. Bafna et al. teach a filter for candidate peptides based on the mass that approximately equal the mass of the experimental peptide (page S14, col. 2, lines 43-49).

29. Claim 24 recites providing a physical sample of the experimental and candidate peptide and biological information for each.

30. Bafna et al. teach that the identification method is to identify proteins in a complex mixture which would include the physical sample of the experimental and the candidate peptide (Abstract), where the biological information pertaining to both are included, for example, in the MS/MS spectra and database.

31. Bafna et al. teaches calculating probabilities based on extra information associated with the experimental and candidate peptide, the sequence, hypothesis that the candidate sequence is correct, hypothesis that the candidate sequence is not correct, but does not teach a likelihood ratio on which the scoring is based (claim 12, line 10).

32. Blumenfeld et al. however, teaches biallelic marker typing using a likelihood ratio from two probabilities, based on two hypothesis where a suspect marker (S) is the same as a another marker (P), or S is not P (col. 108, line 53-65).

33. It would have been obvious at the time the invention was made to One of ordinary skill in the art would be motivated to.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used the three module matching and scoring method taught by Bafna et al. (page S14, col. 2, lines 19-50; and S15, col. 1, lines 18-20) with the likelihood ratio matching technique taught by Blumenfeld et al. (col. 108, lines 35-65). One of skill in the art would have been motivated to use the likelihood ratio of Blumenfled et al. because Bafna et al. suggest that the success of the algorithms relies on the availability of a good scoring mechanism (Banfa et al., page S15, col. 1, lines 15-17). One of skill in the art would have had a reasonable expectation of success at combining the scoring mechanism taught by Bafnia et al. which uses p-

values and hypothesis with the likelihood ratio of Blumenfeld et al. because it is based on probabilities and two hypotheses, as that of the Bafnia et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna Skibinsky whose telephone number is (571) 272-4373. The examiner can normally be reached on 8 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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